



UNITED STATES NAVY

MEDICAL NEWS LETTER

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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The Surgeon and Steroids

With today's pharmacopeia, the surgeon as well as the internist must have fundamental practical knowledge of endocrinology and its older brother, biochemistry. Although "steroids" is a broad term, for purposes of this discussion, it is taken to mean cortisone and its analogues, and corticotropin (ACTH).

Selye's important delineation of stress—including surgical trauma—encompasses a series of alterations called the "general adaptation syndrome" evidenced by tachycardia, fever, sweating, hemoconcentration, elevated sedimentation rate, increased circulating fibrinogen with an increased tendency to clot, leukocytosis, lymphopenia, and eosinopenia. These changes are attributed to stimulation of the hypothalamus, the anterior pituitary gland, and the adrenal cortex, in that order. There has been some reason offered for reservation in acceptance of Selye's concept in its entirety.

Failure of the stress mechanism is recognized as shock evidenced by hypotension, persistence of tachycardia, hemoconcentration, hypoglycemia, and loss of muscle tone. In countershock, epinephrine and norepinephrine are released from the adrenal medulla. These hormones act to restore vasomotor tone. Epinephrine stimulates the anterior pituitary to increase production of ACTH. The latter, in turn, increases the release of the hormones of the adrenal cortex. The mineralocorticoids increase glycogenolysis to elevate the blood sugar level, and increase lysis of lymphocytes and eosinophils to raise the gamma globulin level.

The body normally responds to stress by making available increased amounts of corticoids. Instances of improvement or deterioration of rheumatoid arthritis following any surgical procedure have been repeatedly documented. Classically, the patient with latent gout reacts with an acute attack of arthritis in response to trauma, surgical or otherwise. This is the axiomatic acute arthritis in a convalescent surgical patient.

Surgical intervention, with its attendant anesthesia, induces crisis with possible shock due to failure of the stress mechanism. Viewing the subject broadly, the surgeon would be well advised in assaying a prospective patient from the standpoint of the potential function of his hypophyseal-adrenal axis in times of stress. Thorn's test will reveal the occasional patient with a constitutionally inferior stress mechanism and will uncover previously unrecognized Addison's disease.

Postoperative shock unexplained by hemorrhage or perforation of a viscus should be investigated for acute adrenal insufficiency. In addition to falling blood pressure, hyponatremia and decreased carbon dioxide combining power strongly suggest hypoadrenalism. In fact, hypotension after a surgical procedure, especially if it does not respond to blood transfusions or vasopressive drugs, must be considered due to hypoàdrenocorticism. In these situations, adequate doses of steroids are indicated.

Extensive, prolonged surgical procedures make an old or depleted patient a candidate for adrenal failure. In addition to patients with constitutionally inadequate adrenals or actual disease of the adrenals, today's surgeon must also be concerned about patients to whom adrenocorticosteroid medication is being or has been administered. The patient may be unaware of steroids previously prescribed; such information must be sought. Patients with present or past joint disease, allergy, severe colitis, or with inflammations of the skin or eyes should be suspected. The kind of steroid and its dose ought to be known.

Important side effects of cortisone include tendency to electrolyte disturbances, possibility of inducing or activating latent diabetes mellitus, increased susceptibility and lowered resistance to infection, osteoporosis, psychic changes, and Cushing's syndrome manifestations. Further effects to be remembered are possible suppression—to the point of destruction—of the adrenal cortex and the pituitary gland. Some or even all of these minor and major complications are unavoidable in patients taking currently available corticosteroids continuously for their systemic effect. They have not been known to follow steroids administered in ointments or eye drops or as intra-articular or periarticular injections. Adrenal suppression depends upon duration of steroid administration and doses used. Adrenal atrophy and hypofunction can be determined within weeks after treatment is started. Atrophy of clinical importance must be presumed to exist after a patient has been given steroids for 6 days, and may be detected as long as four and one-half months after discontinuation of steroids. Anyone with a frank history or suspicion of steroid treatment within 6 months is a likely candidate for shock under stress.

Abrupt discontinuance of steroids induces iatrogenic Addison's disease. Should the patient at this time experience unusual stress, the results may be dramatic and disastrous. In the face of some surgical complications of use of steroids—such as gastrointestinal hemorrhage—the surgeon faces the necessity of continuing the agents responsible for the presenting disease state.

Of course, in this day of applied endocrinology, the referring internist has great obligations. He must fully acquaint the surgeon with the endocrinologic hazards. He must not abandon his patient to the surgical service, but remain ever watchful and ready to advise. He must carefully select and keep as small as possible the number of patients given steroids systemically.

Preoperative Preparation. In addition to general careful physical appraisal, determinations of circulating potassium, sodium, and dextrose, together with measurement of blood pressure and tests for glycosuria, should be performed. Electrocardiographic changes may be helpful in suggesting hypokalemia.

Maximal stimulation of the adrenal cortices in a normal man weighing 70 Kg results in secretion of about 240 mg of hydrocortisone daily.

Administration of 250 mg hydrocortisone per day should approach adequate replacement during severe stress. A patient given oral steroids in the usual minimal doses is ordinarily given 50 mg hydrocortisone IM 24 hours, 12 hours, and immediately before the operation. The patient with a history of maximal doses must receive proportionately larger amounts preoperatively. Forty units of long-lasting ACTH is injected IM before the operation. A patient with a long history of steroid medication should be given 100 mg hydrocortisone IV during the operation.

Postoperative Care. Postoperatively, the patient is given 50 mg hydrocortisone IM at 8-hour intervals for 3 doses and then at 12-hour intervals for 2 doses. The doses would be increased or reinforced with desoxycorticosterone and norepinephrine in the presence of a falling or poorly sustained blood pressure. On the third postoperative day, the patient may again take steroids orally. Ordinarily, the patient is given 3000 ml of physiologic solution of sodium chloride, with or without 5% dextrose, on the day of operation and daily until resumption of oral fluids. The more prolonged and traumatic the surgical procedure, the larger the doses of steroids must be.

The patient receiving steroids who is about to undergo an emergency operation should be given 100 mg hydrocortisone IV in one liter of physiologic solution of sodium chloride and 40 units of corticotrophin gel during the operative procedure. He is then treated as described above.

To the patient already in shock not due to blood loss, 100 mg hydrocortisone should be given IV at once. Hydrocortisone—50 mg—with appropriate vasopressors, should be given every 6 hours thereafter. The metabolic effects of hydrocortisone are observable within one hour after IV injection; a peak effect may be expected in 3 hours.

Preoperative administration of steroids and postoperative care are by no means stereotyped—particularly the latter. Both must be highly individualized as dictated by frequent painstaking observation of vital signs, biochemical values, and the patient's general physical and mental status. (E. F. Traut, *The Surgeon and Steroids*: J Int Coll Surg, 34 (Section I): 302-308, September 1960)

* * * * *

Diagnostic Laparotomy

A laparotomy undertaken without effort to make a diagnosis beforehand is looked upon with disfavor; this is proper. Yet a clinical discipline too strict in its dependency on roentgenography and chemistry may dangerously put off the direct course offered by a diagnostic laparotomy. Sometimes this operation is delayed until everything else has been tried and the patient's funds, patience, and chance of cure have all been sadly diminished. Laparotomy for diagnosis deserves earlier frequent use and greater respect.

Unfortunately, reasons not concerned with the best interest of the patient may weigh against the use of a diagnostic laparotomy. An exploration revealing no pathologic condition may, for example, embarrass both the referring physician and the surgeon because it testifies to their lack of diagnostic acumen. The surgeon may fear further embarrassment because he believes he has performed an unnecessary operation and will be accused of this. Vanity and lack of confidence may take precedence over the patient's welfare. If the laparotomy discloses a disease-free abdomen, the patient makes no criticism; he is relieved to have the matter settled.

An influence clearly concerned with the best interests of the patient rather than with the doctor's embarrassment which may delay laparotomy, is that of operative risk. If the operation is dangerous it should be avoided. A laparotomy alone, however, in which no major resections are required has a low risk. In fact, the risk of an exploratory laparotomy is probably less than that of an exploratory thoracotomy. Despite this fact, a diagnostic thoracotomy would appear to be more acceptable today, possibly because its use follows demonstration of an objective sign—a roentgenologic shadow. The futility of extensive preoperative diagnostic tests in pulmonary coin lesions is now recognized. Findings which may lead to a laparotomy, such as pain, indigestion, ill-defined masses, or chronic "flu," are vague in comparison with an x-ray shadow, but still sufficient for the responsible surgeon.

When a diagnostic exploratory laparotomy is undertaken, it should be done by a qualified surgeon. As a surgeon should not undertake an appendectomy unless he is able to perform a colectomy, he should not undertake a diagnostic laparotomy unless he is competent to perform a pancreatectomy or resect an aortic aneurysm.

A diagnostic laparotomy does not always have to be a general abdominal exploration, but it should be adequate for the specific case. In jaundice of doubtful cause, for example, a 2-inch incision that merely allows biopsy of the liver is not enough. The incision should be made twice as long so that the gallbladder and the common duct can be palpated. This is the quickest way of differentiating jaundice amenable to surgery from medical jaundice. If stones are found, definitive treatment can be undertaken immediately. If not, a 4-inch subcostal incision heals about as well as a 2-inch incision.

In addition to having wide technical competence, the surgeon undertaking a diagnostic laparotomy must also be able to reach a decision at the operating table concerning the best course. The responsibility is difficult.

There are pitfalls. The surgeon must avoid magnification of minor or insignificant pathologic conditions. If the exploratory findings are negative, he must admit this, both to the patient and to himself. It is enough, in such a case, if serious intra-abdominal disease has been ruled out. Fortunately, one hears little now of the dropped kidney, the retroverted

uterus, or of chronic appendicitis, but the surgeon must also avoid attributing symptoms to nonobstructing adhesions, duodenal diverticula, or small cysts. The surgeon must be wary of the psychoneurotic. He cannot avoid all of these people for they may need surgery—even a diagnostic laparotomy—but indications must be strong. The deterring effect of laparotomy scars is traditional and sound. (F. J. Lewis, Editorial, The Diagnostic Laparotomy: Surg Gynec & Obstet, 111: 376-377, September 1960)

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Indications of Postoperative Thromboembolism

A study was made to determine whether a period could be found in patients undergoing extensive surgery when significant alterations occurred in blood coagulation and total circulating platelets which could fix a possible time of thrombus formation—a steadily increasing, often fatal surgical complication. The study suggested itself after an earlier observation that surgical thromboembolism, as noted at autopsy, occurred most frequently from the day of operation to the eighth postoperative day. It was assumed that thrombosis, venous or arterial, could develop preceding, during, or after operation and give rise to pulmonary embolism or coronary, cerebral, or mesenteric artery thrombosis. Because these arterial thromboses were observed to occur occasionally in the absence of arteriosclerosis, it was believed possible that some alteration of blood coagulation alone could explain this phenomenon.

In the authors' study, blood coagulation determinations and platelet counts were made during the entire course of patient's surgical hospitalization, especially on the day of operation. The latter period was chosen for more intensive scrutiny because this was the day when the earliest thromboembolic episodes had been observed and the time judged to be the period of probably greatest stress. Because of the distinct increase in blood platelets during the postoperative period, it was believed possible that the source of the platelet increase was the breakup of the increased number of megakaryocytes into platelets in the pulmonary capillary bed during the surgical stress.

From study of 41 unselected patients, the blood values obtained clearly indicated that at least one, and sometimes two, transient abrupt episodes of marked shortening of blood coagulation times associated in all instances with a transient increase in platelets occur in the patient undergoing extensive surgery. The shortening of blood coagulation time often falls below normal levels and may, therefore, be designated as blood hypercoagulability. It would appear that this period of blood hypercoagulability may be the most critical and the most likely time for development of either venous or arterial thrombosis.

Despite increased hypercoagulability in several patients, thromboembolism did not occur. From this, it may be concluded that the point at which thrombosis occurs may vary somewhat from one individual to another, but that thrombosis is most likely to occur when the change in blood values is most marked. It may also be surmised from these facts that it may require a relatively slight alteration of blood coagulation time in order to prevent thrombosis.

In the authors' opinion, the associated platelet increase is not necessarily the cause of thromboembolism, but is merely a reflection of what transpires in the pulmonary capillary bed of patients under surgical stress. It would appear that the stress of extensive surgery may be the stimulating factor productive of blood hypercoagulability and its associated thrombocytosis. This situation may occur chiefly during or, occasionally, immediately after operation and may also occur in the first 5 postoperative days.

Blood hypercoagulability and platelet increase are not influenced by the type or duration of operation nor by the age of the patient. Spinal anesthesia compared to general anesthesia does, however, produce less marked blood alterations in most instances. Yet severe alterations in blood values may be observed in a few individuals given a spinal anesthetic, indicating that this form of anesthesia will not entirely prevent thromboembolism.

If the proposed theory is valid, anticoagulation appears to be the only potential means of counteracting this phenomenon. From observations made in this study, preventive anticoagulation would need to be instituted preoperatively, maintained during operation, and continued for the greater part of the postoperative period. The authors' observations tend to indicate that only a small degree of anticoagulation may suffice to prevent thromboembolism. The degree and type of anticoagulation that may be effective can be determined only by a thorough trial and study. (J. G. Sharnoff, et al, The Possible Indication of Postoperative Thromboembolism by Platelet Counts and Blood Coagulation Studies in the Patient Undergoing Extensive Surgery: Surg Gynec & Obstet, 111: 469-474, October 1960)

* * * * *

Hemostasis

Progress in control of abnormal bleeding is still stymied by the erroneous concept that hemorrhage after injury is stopped by a fibrin plug and that the clotting time is a reliable measure of coagulability and hemostasis. It is to be emphasized that hemostasis is a physiologic process and not a mechanical one. The test tube alone, therefore, cannot furnish the complete answer to this important problem.

A marked anatomic difference exists between the arterial, venous, and capillary divisions. Thus, the artery has a thick wall which, together with

its deep location, makes it less vulnerable to injury than a vein with its relatively thin wall. Injury of an artery or even an arteriole is more serious, however, because the blood pressure within is high. The most vulnerable vessels are small arteries and arterioles; in them, the pressure is high in relation to the thickness of the wall. This, no doubt, accounts for their frequent involvement in hemorrhagic diseases such as hemophilia.

Capillaries differ markedly from veins and arteries. Their wall is composed of a one-cell layer of thickness. This allows free diffusion of solute of low molecular weight. Under toxic conditions, the permeability of the capillary wall is profoundly altered and may actually allow whole blood to escape. This results in purpuric bleeding, the type seen in acute thrombocytopenia.

The fallacy of the fibrin plug concept of hemostasis is dramatically demonstrated by bleeding in telangiectasia. An injury of a spider nevus which may appear trivial often gives rise to alarming bleeding. Since the coagulation of blood is entirely normal in this disease, it becomes obvious that normal clotting alone does not assure hemostasis. In telangiectasia, the abnormality is anatomic and the vessel has lost its normal physiologic function in response to injury.

From this clue, it may be postulated that the primary hemostatic response resides in the vessel itself. The first reaction to injury is a marked reflex contraction. Injured endothelium develops a "stickiness" when the vessel walls are brought together by contraction; this "stickiness" functions in gluing them together. In small vessels, this may suffice to effect hemostasis, but the organism has a third line of defense against hemorrhage—the clotting mechanism.

Since the last stage of hemostasis—formation of a fibrin clot—is ineffective unless the initial step—contraction of a vessel after injury—is normal, it is easy to comprehend why abnormal bleeding can occur when the coagulation of blood is entirely normal.

Because there are various causes of hemorrhagic state, it is not to be expected that a single test can establish faulty hemostasis. A good medical history is the first step in the diagnostic approach to a bleeding state. A careful history is often sufficient to make a tentative diagnosis. Second in importance is the physical examination; observation of the skin yields much valuable information. Only after the first two steps have been carefully completed should the laboratory study begin. In the past, much emphasis was placed on bleeding and clotting times, but even when these tests were carried out carefully, normal results gave no assurance that hemostasis was normal. Gradually, it is being recognized that routine tests, such as the bleeding and clotting times, are of limited value and, even more so, when carried out indifferently and by unstandardized techniques. Much more can be accomplished by omitting these routine tests when the patient has no history of bleeding, and to study thoroughly only those whose history and physical examination are suggestive of a hemorrhagic state.

For such a study, the following tests are recommended: (1) clotting time, (2) bleeding time, (3) tourniquet test, (4) platelet count, (5) one-stage prothrombin time, and (6) prothrombin consumption tests. These procedures have been carefully standardized, are relatively simple to perform, and furnish sufficient information needed for diagnosing all but an occasional hemorrhagic state.

By means of this small group of tests, the hemorrhagic diseases due to defects of coagulation can, in most instances, be readily diagnosed. Protective therapy may then be instituted before surgery. (A.J. Quick, Hemostasis - Theoretic and Clinical Aspects: *Plast Reconstr Surg*, 26: 321-325, September 1960)

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Rectal Biopsy for Diagnosis of Amyloidosis

For many years, verification of clinically suspected amyloidosis was largely dependent upon the Congo red test. The inadequacy of this procedure is proved by the variations in technique suggested and the variable criteria of a "positive" result.

Development of biopsy methods has resulted in a definite trend to obtain histologic proof of clinically suspected disease. In amyloidosis, such direct proof has been found in needle biopsies of the liver and kidney and surgical biopsies of the skin, lymph nodes, spleen, muscle, tendon, stomach, tongue, and gingiva. Most, if not all, of these methods present disadvantages.

An ideal routine biopsy technique for diagnosis of amyloidosis should be based on the following principles: (a) readily available involved organ, (b) operative ease assuring an adequate specimen, (c) absence of complications, and (d) minimal discomfort to the patient. With these objectives in mind, biopsy of the rectal mucosa was suggested and employed by the authors in 30 cases of clinically established amyloidosis.

In the series, the authors found rectal biopsy to be the most efficacious method in establishing the diagnosis of amyloidosis—26 out of 30 cases. The procedure is so simple from both the physician's and the patient's point of view that it usually was the first test performed. No complications were encountered and no false-positive pathologic reports received. Repeat examinations, if necessary, were unhesitatingly suggested by the physician and were readily accepted by the patient.

Since a positive Congo red test depends upon the quantity of amyloid present and its avidity for the dye, it is obvious that a biopsy technique is necessary if the diagnosis of amyloidosis is to be established in its earlier stages. The efficacy of rectal biopsy as an easily repeatable procedure for early diagnosis of amyloidosis has been proved in cases of familial Mediterranean fever. In this disease, genetically determined and predictable amyloidosis appears.

The technique employed by the authors includes sigmoidoscopy performed in the usual manner after preparation by glycerin suppository or saline enema. Punch biopsy is obtained at two or three different levels in order to assure an adequate specimen. The biopsy site is cauterized by local application of 20% silver nitrate solution.

Although it was to be expected that positive results would be high in the rare cases of primary amyloidosis, no more than 50% could be expected in secondary amyloidosis according to the literature. The high incidence of positive rectal biopsies in the authors' series indicates that the incidence of intestinal involvement by amyloidosis is much greater than has previously been assumed. (J. Gafni, E. Sohar, Rectal Biopsy for the Diagnosis of Amyloidosis: Amer J Med Sci, 240: 332-336, September 1960)

* * * * *

Differential Value of BSP Test

Differentiation of extrahepatic obstructive jaundice from parenchymal jaundice in management of patients with biliary disease continues to be difficult. Many tests of hepatic function have been devised in an attempt to solve this problem. Determination of bromsulfalein retention has been recognized for many years as a sensitive, efficient indicator of hepatic damage in nonjaundiced patients; in jaundiced patients, however, its value has been controversial. The initial objection to use of this test in presence of jaundice was the difficulty of accurately reading dye concentration with the visual comparator block in icteric serum. However, the photoelectric method of determination of bromsulfalein in icteric serum with use of proper filters makes accurate chemical determinations possible. Nonetheless, continued objection to use of this test in presence of jaundice has been voiced by some who believe that increased hepatic damage might result and that presence of regurgitation jaundice vitiates the result.

Considerable data exist to suggest that there is a difference in bromsulfalein retention in hepatitis and extrahepatic obstruction. The authors conducted studies on over 100 patients, some with each condition, for comparison of bromsulfalein retention. Most patients with hepatitis had retention of 50% or more; 85% were greater than 45%, and 75% had retentions of 50% or more. Conversely, 81% of patients with obstructive jaundice had bromsulfalein retention of less than 50%. The average figures for bromsulfalein retention in patients with hepatitis were 55.6%; in obstruction, 40.7%. No good correlation was exhibited between the levels of serum bilirubin and the levels of bromsulfalein retention in the patients with hepatitis; however, there was some suggestion of correlation in patients with obstructive jaundice. There were no toxic effects of the bromsulfalein test.

Recent studies of the mechanics of bromsulfalein metabolism support these observations and explain some of the mechanisms of differentiation.

Apparently, there is a twofold mechanism of bromsulfalein metabolism—initial uptake and storage in the hepatic cells followed by excretion, the storage rate apparently depending directly upon the concentration in the surrounding plasma.

Two different metabolic products, as a result of passage of bromsulfalein through hepatic cells, have been demonstrated with a difference in the pattern of distribution of the metabolites in experimental hepatocellular and extrahepatic obstructive jaundice. In patients with hepatitis and cirrhosis, the conjugated dye found circulating in the serum is less than in patients with obstructive jaundice; good correlation exists between the extent of cellular damage and lack of excretion of conjugated dye. In extrahepatic obstruction, the reverse situation obtains—the amount of conjugated dye found being significantly greater than in parenchymal cell disease.

It would appear, then, that hepatic cells, despite presence of mechanical obstruction, are able to extract bromsulfalein from the serum, store and conjugate it, and discharge the products where they are again found in the blood. Whereas, hepatic cells, the seat of acute damage from viral invasion, are unable to perform this extraction-storage-conjugation. The difference is frequently sufficiently pronounced to be determined by conventional laboratory bromsulfalein determination; the result is frequently of clinical value. (J.S. Reich, W.D. Davis Jr, The Differential Value of Bromsulfalein Retention Tests in Acute Hepatitis and Obstructive Jaundice: Amer J Dig Dis, 5:770-775, September 1960)

* * * * *

Peritoneal Dialysis

Artificial dialysis is frequently needed in treatment of acute renal failure. The artificial kidney is a well-known and efficient method of dialysis, but this apparatus requires a trained team to operate it. Either the apparatus or the team—or both—may not always be available at the time of need. Continuous peritoneal lavage was first attempted clinically in 1923 with only rare success. Later—in 1951—intermittent peritoneal dialysis in nephrectomized animals was introduced; in 1959, the procedure was applied clinically with effective results. The authors describe their experience with nine patients suffering from prolonged oliguria.

Dialysis with any type of artificial kidney is usually immediate, requiring only approximately 6 hours to remove large amounts of noxious materials. Whereas intermittent peritoneal lavage removes fluid and metabolic products at a much slower rate, it appears adequate. It is a simpler method requiring few experienced personnel; the necessary material is available in any general hospital. In the fatal cases observed by the authors, a serofibrinous exudate, particularly near the paracentesis tube, was the only abnormal finding; slight

amounts of straw-colored fluid present in the abdominal cavities proved to be sterile. Antibiotics were used and infections were not a problem.

Peritoneal lavage simulates one function of the glomerulus of the kidney in that a solution may be dialyzed through a semipermeable membrane and no selective reabsorption is involved. The peritoneal membrane permits passage of water and electrolytes (crystalloids) from the blood to the peritoneal cavity, but only allows a few red and white blood cells and a small amount of protein to escape into the dialysate. The direction of flow is dependent on the pressure (concentration) differences between the vascular and peritoneal fluids, the flow being from a higher pressure to the lower one until an equilibrium is established. Osmolarity will determine the flow of water.

In the dialysing fluids used by the authors, concentrations of sodium, chloride, and bicarbonate were similar to those of blood so that little change occurred. Potassium was not added since one of the objectives of dialysis was removal of potassium from the body. The glucose concentration was higher than in the blood and was absorbed from the lavage solution. Other metabolic products were removed proportionately to their concentration in the blood.

Equilibrium between blood and peritoneal lavage solution was established within 2 hours. Usually, two lavages in 24 hours were sufficient, but in patients with severe injuries and an excessive catabolic response, a greater number may be required.

A rapid progressive normochromic, normocytic anemia is a constant feature of renal failure which is well tolerated during the oliguric phase. Transfusions may precipitate pulmonary edema or cardiac failure and must be given judiciously.

Clinical and biochemical abnormalities continue with onset of diuresis so that peritoneal dialysis may be necessary for a few days. Fluids and electrolytes still need restriction to prevent a 24-hour urinary volume of more than 3 liters. Mortality during the diuretic phase can probably be reduced by close observation and by fluid and electrolyte restriction. Undoubtedly, this is a complicated metabolic derangement, requiring further study. (E.A. Cleve, F.P. Smith, MAJ N.M. Hensler USAF MC, Peritoneal Dialysis in Renal Failure: Amer J Med Sci, 240: 319-326, September 1960)

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Permanence of Tetanus Antitoxin

Duration of active immunity varies considerably depending upon the subject, antigen, and method whereby that immunity was induced. In prevention of tetanus, the physician is frequently hard pressed to decide whether antitoxin or toxoid will be the prophylactic of choice. On many occasions,

physicians have felt a legal obligation to administer tetanus antitoxin prophylactically for penetrating wounds, regardless of the conditions of infliction of the wound. Increasingly frequent are the complications secondary to serum sensitivity despite the relatively small inoculum of foreign proteins. Therefore, appraisal of the present condition is timely.

For 20 years or more, babies and children in this country have been receiving tetanus toxoid as part of the battery of prophylactic inoculations, frequently with one or more boosters during school age. During World War II, 10 to 12 million men and women received a basic course of tetanus immunization in the military services, while annual or biennial boosters were considered routine. In addition, many industrial employees are compelled to undergo prophylaxis to tetanus as a condition of employment. Therefore, it would seem reasonable to take advantage of this situation to provide recall immunity by a single booster of tetanus toxoid rather than to resort to the routine, and frequently indiscriminate, use of tetanus antitoxin for prophylaxis of lockjaw.

From studies of tetanus antitoxin titers taken at annual intervals following injection, and determinations of titers evoked by recall or booster injections, the authors present data which indicate rather conclusively that even a single course of tetanus toxoid inoculations will confer at least minimal protection against tetanus for 4 years and, in many instances, for much longer. Moreover, these data show equally conclusively that even a small booster dose of tetanus toxoid, inoculated intracutaneously, will evoke a recall response considerably in excess of the minimal protective level regardless of the interval since the last exposure to the antigenic effects of tetanus toxoid.

Whether mobilization or generation of antibody can be accomplished rapidly enough by means of booster inoculations of tetanus toxoid cannot be answered from present knowledge. It has been reported that a booster inoculation of tetanus toxoid produced early as well as marked increase in serum antitoxin content in 100% of ex-servicemen (Canadian) even though the last stimulus had been given as long as 15 years previously.

In questionable cases, or where trauma may have permitted extensive contamination, it should be borne in mind that penicillin or broad spectrum antibiotics can be employed simultaneously in instances where the incubation period of tetanus might be short and where the patient's own immune forces could not be mobilized early enough to meet the emergency.

The physician should be alerted to the fact that a large proportion of children and young adults possess a basic immunity to tetanus which may alter the recommended procedures of the past 20 years. Reasonable doubt is raised concerning the need for routine antitoxin prophylaxis of wounds among patients who have had an earlier series of toxoid injections.

(J. M. Rueggeger, Further Observations on the Permanence of Tetanus Antitoxin: Arch Intern Med, 106: 410-416, September 1960)

IN MEMORIAM

Hogan, John A. CAPT DC USN	
U. S. Naval Hospital, St. Albans, N. Y.	27 August
White, John R. CAPT MC USN (Ret)	
U. S. Naval Hospital, Charleston, S. C.	9 September
Jackson, Thomas L. LCDR MSC USN (Ret)	
Seneca, Maryland	12 September
Dorsey, Edward G. LT MSC USN (Ret)	
U. S. Naval Hospital, San Diego, Calif.	14 September
Knight, Della V. LTJG NC USN (Ret)	
U. S. Naval Hospital, Oakland, Calif.	17 September
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Jenkins, Harry A. CDR MC USN	
U. S. Naval Hospital, Newport R. I.	29 September
Pollard, John B. CAPT MC USN (Ret)	
U. S. Naval Hospital, Annapolis, Md.	2 October

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Radiation Exposure Evaluation Laboratory -
Dedication at NNMC

The Radiation Exposure Evaluation Laboratory, a facility unique in the medical services, was dedicated on 14 October 1960 at the National Naval Medical Center, Bethesda, Md. In his dedicatory remarks, The Honorable James H. Wakelin Jr., Assistant Secretary of the Navy for Research and Development, pointed out that although the building was not the first evaluation laboratory, it was the first of its kind in Naval, as well as other, medical facilities, in that it was a self-contained unit with facilities for patient treatment as well as for manifold scientific evaluations. In accepting the building for the Navy Medical Department, RADM B. W. Hogan, Surgeon General of the Navy expressed pride and appreciation for having such a facility to aid in the advance of atomic medicine and hoped that in the not too distant future a similar facility would be available on the West Coast.

With sources of exposure of Naval personnel to ionizing radiation increasing over the past several years, the need for a center to evaluate individuals suspected of exposure to radiation or to manage and treat patients actually exposed had become more and more apparent. In February 1957, the Surgeon General requested advice on this matter from several sources. A minimum of one shielded room for whole-body counting was recommended. After several weeks of effort, a specially appointed committee at NNMC recommended that a separate building be erected and placed under the administration of the Department of Radiology of the Hospital. Subsequently, the Bureau of Medicine and Surgery presented a program to the Congress for a Radiation Exposure Evaluation Laboratory (REEL), prepared under the direction of CAPT E. C. Stone of the Planning Division, and CAPT P. F. Dickens of the Special Weapons Defense Division.

After approval of the program by Congress, ground was broken for the REEL building on 12 August 1959 (Medical News Letter, Vol. 34, No. 9, 6 November 1959); the building was completed on 15 July 1960 and occupancy begun during August.

An integral part of the Hospital Command of the Center, the Laboratory is under the supervision of CAPT E. R. King, Chief of Radiology, with CAPT J. S. Burkle as Director. The Laboratory is manned by a team of physicians, nurses, physicists, and technicians and can furnish complete care, including required laboratory studies, to radiation patients. A surgery is located on the second floor where minor surgical procedures can be carried out if the patient has been exposed to thermal or mechanical trauma as well as radiation. Surgeons and other specialists on the staff of the Hospital can be called upon for consultation.

Three patient rooms are available for care required by those who have received high doses of ionizing radiation. It is planned that, if feasible, one room will be converted to a near "germ-free" room in order to minimize chances of infection in these susceptible patients.

In order to maintain the efficiency of the staff of the REEL, as well as to develop new techniques of diagnosis and management of radiation patients, several projects utilizing the laboratory are planned or under way. These include total-body radiation therapy, bone marrow transplants, chromosomal observations in human subjects, changes in urinary excretion of certain amino acids following total-body radiation, enzyme system changes following radiation, and others.

Expressing the importance of the REEL, the latest Naval medical facility, ADM Hogan stated: "Construction of this laboratory represents a milestone in the meteoric progress of atomic age medicine. By its establishment, we have been given the means for exploration of the basic effects of ionizing radiation. From these studies, we believe, will evolve data which will result in new criteria for radiological safety, new means of treating human exposure victims, and new concepts of radiation therapy."

OCS Program Open to Hospital Corps

Attention is invited to the provisions of BuPersInst 1120.29A setting forth instructions for Officer Candidate School Programs for enlisted members of the U.S. Navy and U.S. Naval Reserve. This program remains open and applications may be made at any time by eligible enlisted men and women for appointment in the various sections and specialties of the Medical Service Corps, including the Supply and Administration Section.

Selected applicants will be ordered to the U.S. Naval Schools Command, Newport, R.I., designated as officer candidates within their present pay grades, and provided a 4-month indoctrination course. Upon successful completion of indoctrination, selected candidates will be appointed as Reserve officers in the grade of Ensign, Medical Service Corps and will be required to serve on active duty in commissioned grade for 3 years from date of acceptance. Opportunities will exist for voluntary extensions of active duty in accordance with the needs of the service and it will be possible for some outstanding officers to augment into the Regular Navy.

It should be noted that this program is in addition to the annual in-service procurement program for Regular Navy as outlined and described in BuPersInst 1120.15D. Significantly, candidates for the OCS program may be either USN or USNR and may be eligible up to age 34 and 1/2 years at time of application.

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BUMED NOTICE 4651

7 October 1960

Subj: Annual meetings, conventions, or conferences of a technical, scientific, or professional nature convened by non-Federal organizations; guidelines for Bureau defrayment of travel and per diem expenses for Medical Department officers

Travel funds for fiscal year 1961 have been drastically curtailed for the entire Navy. As a result, the Bureau of Medicine and Surgery will be unable to sponsor travel to professional and scientific meetings to the same extent as in previous years. It will be essential that each request for such travel be carefully screened at both local and Bureau levels to insure maximum conservation of funds. In general, approval for attendance at important professional and scientific meetings will not be granted to more than one person from a given facility. Officers should not accept invitations to participate in programs prior to Bureau approval unless authorization orders at no expense to the Government will be acceptable in case of Bureau disapproval.

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From the Note Book

Pfizer Merit Award to Navy MOs. During a recent convention of the U. S. Civil Defense Council in Minneapolis, Minn., the Pfizer Merit Award was presented to three Navy Medical officers. CAPT Harry S. Etter MC USN received the award for Research in the Field of Radiological Warfare. CAPTs Ralph E. Duncan and Wayne P. Chesbro MC USNR were honored for their work in Organizational Activity in Civil Defense and Disaster; and Chemical, Radiological and Biological nonmilitary Defense and Mass Casualty Care. CAPT Carroll Hungate MC USNR, Chairman of the Medical and Health Committee of the U. S. Civil Defense Council, and Chairman of the Committee on Disaster Medical Care of the American Medical Association, presented the awards. Earlier, CAPT Chesbro had received a Commendation for Outstanding Services related to nonmilitary defense activities from the Surgeon General of the Navy, RADM B. W. Hogan.

Autopsy Manual. This manual, prepared at the Armed Forces Institute of Pathology, has been released as a Tri-service publication, available to the Navy as NAVMED P-5065. The manual provides the prosecutor with ready and concise criteria on postmortem procedures and examinations. Its publication is presented as a guiding directive toward uniformity in the selected techniques and objectives of an autopsy. Initial distribution throughout the Medical Department of the Navy has been made by the Bureau of Medicine and Surgery. Further copies for official use may be obtained from the Bureau; or for personal or civilian use from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at 50 cents per copy.

New Lantern Slide Set. A new lantern slide set—Inflammatory Dermatoses (Dermal)—has been completed by the Armed Forces Institute of Pathology, and is available on loan from the Illustration Library, Medical Illustration Service, AFIP, Washington 25, D. C. (AFIP Letter, October 1960)

Effectiveness and Toxicity of Antibiotics. Ristocetin, vancomycin, and kanamycin were alternately administered to 131 patients with severe staphylococcal infections or bacterial endocarditis. The conclusion was reached that these antibiotics are effective antistaphylococcal agents of approximately comparable activity. They all exhibit toxicity greater than that found with the tetracyclines, penicillin, chloramphenicol, and erythromycin. Therefore, they should be used only in cases that have not or are not likely to respond to safer antibiotics and in which the condition of the patient justifies the risk. (B. Waisbren, et al, Arch Intern Med, August 1960)

Pharmacologic Properties of Selected Antibiotics. Streptomycin, dihydrostreptomycin, chloramphenicol, tetracycline, and oleandomycin produce

hypotension and slowing of heart rate in the anesthetized rabbit. Contractions of the isolated rabbit heart are increased in amplitude by small doses of tetracycline and depressed by larger amounts. The other antibiotics except chloramphenicol produce depression of the nictitating membrane preparation. This study reveals multiple pharmacologic actions of antibiotics which may contribute to their cardiovascular responses. (F. Leaders, et al, Antibiot Chemother (Wash), August 1960)

Heparin Neutralizing Lipid. In this study, a powerful heparin neutralizing compound was isolated from the fresh blood of man and animal and the fresh liver of animals. This compound has the properties of a complex acidic phospholipid and it was found to neutralize the effect of heparin on blood clotting without toxicity both in in vivo and in vitro tests. (D. Amatuzio, et al, J Lab Clin Med, August 1960)

Potassium Absorption in GI Bleeding. Study has shown that there is significant hemolysis of erythrocytes within the gastrointestinal tract with resultant potassium absorption. The percental of hemolysis and subsequent absorption of potassium depends largely on the presence of feces in the colon, which in turn is related to the quantity of intestinal bacteria present in the feces. This indicates that in a uremic patient with gastrointestinal bleeding mechanical cleansing of the colon and intestinal antibiotics may keep hemolysis and, therefore, potassium absorption, at a minimum and help prevent fatal hyperkalemia. (C. Griffin Jr, P. Schloerb, Ann Surg, August 1960)

Paralytic Ileus Associated with Dicumarol Therapy. Development of signs and symptoms simulating intestinal obstruction in patients receiving Dicumarol should suggest that hemorrhage into the peritoneal cavity may have occurred, possibly combined with segmental interstitial hemorrhage into the intestinal wall. (C. Perez-Mesa, Surgery, August 1960)

Effects of Bile Salt on Gastric Secretion. The relationship of bile to gastric secretion has traditionally been considered as that of a buffer decreasing the acidity of duodenal contents. The authors' present work, studying rats and dogs, reveals gastric secretion to be inhibited by administration of bile salt compounds. Sodium desoxycholate appeared to have the strongest inhibitory effect. (R. Menguy, L. Beissner, Amer J Dig Dis, August 1960)

Internal Mammary Artery Ligation. Because of a great lack of conformity in regard to clinical results in evaluation of internal mammary artery ligation for relief of angina pectoris, the authors repeated a study previously showing increased blood flow. Their repeat studies showed that in the majority of dogs there was a small additional blood flow (5.5 to 9.6 ml/min) from the extracardiac mammary circulation to the coronary circulation—an increase less than their original series. (C. Blair, et al, Ann Surg, August 1960)

Physical Activity and Coronary Atherosclerosis. In autopsies on "normal" Caucasian men between the ages of 30 and 60, who died suddenly from accident, homicide, or suicide, there were no significant differences in the degree of coronary atherosclerosis in those engaged in sedentary occupations and those engaged in physically active occupations. (D. Spain, V. Bradess, *Circulation*, August 1960)

Esophageal Reflex Myocardial Infarction. The author reports deglutition of ice-cold drinks in three instances, and lodging of a hot food bolus in one instance, to have initiated myocardial infarction. In none of the patients had anginal syndrome pre-existed. (H. Roesler, *Amer J Med Sci*, August 1960)

Renal Tubular Necrosis Following Brain Lesions. Five cases are reported in which brain lesions were followed by acute tubular necrosis. Although the cerebral lesions could not be localized accurately, they occurred predominantly in the posterior and orbital regions of the frontal lobe, closely related to the "visceral brain" or limbic system. Data indicate that acute tubular necrosis may be caused by lesions of the brain through a mechanism of renal vasoconstriction. (P. Steinmetz, J. Kiley, *Amer J Med*, August 1960)

Adrenocortical Function after Corticoid Therapy. From observations of three patients who had received long-term glucocorticoid therapy, the authors demonstrated prolonged suppression of adrenocortical function after cessation of therapy. Although functional reactivation is achieved with administration of ACTH, it is doubtful whether it is maintained after ACTH therapy is stopped. This is in contrast to the experience and reports of many others. (G. Carreon, et al, *J Lab & Clin Med*, August 1960)

Status of Adrenals in Asthmatic Patients. As a result of studies exploring the various aspects of pituitary-adrenal relationships, the authors conclude that their findings support the concept that adrenal cortical insufficiency is not a factor in the pathogenesis of bronchial asthma. (I. Kass, S. Appleby, *Amer J Med Sci*, August 1960)

Skin Diving Injury. A case is reported in which a diver with SCUBA developed a monaural inner ear, neural deafness following a descent to 35 feet. Spontaneous recovery of serviceable hearing occurred by the end of 8 weeks; a deficit in higher frequencies persisted. (M. Heller, *Arch Otolaryng*, September 1960)

Medihaler-Ergotamine for Migraine. Presenting results with 60 patients, the author discusses the value and effectiveness of inhalation ergotamine and shows complete or partial improvement in 44 cases. Advantages of the inhalation route for ergotamine over oral and parenteral methods are delineated. (R. Ryan, *Arch Otolaryng*, September 1960)

DENTAL**SECTION**Pulp Conservation with Antibiotic Agent

With use of a new technique, 35 of 38 teeth (97%) with advanced carious lesions were restored successfully to function without resorting to root canal therapy. The teeth were so seriously damaged that ordinarily endodontic treatment or extraction would be considered the only remedies. Treatment consisted of removing the carious tooth structure—even if this resulted in exposure of the pulp—and utilizing drugs to prevent further development of the carious lesion or pulpal involvement. The treated teeth were not mobile, were not in the late stages of pulpitis, had vital pulps, and had enough tooth structure remaining that a permanent restoration could be placed. In many instances, Rocky Mountain stainless steel bands were adapted and cemented in place.

Initially, according to the technique described by the authors, the tooth is subjected to vitality, percussion and mobility tests, and examined roentgenographically. A one-tooth rubber dam is applied, if possible, or cotton rolls are used to maintain a dry field. The dam and tooth are sterilized with a solution of 1% benzalkonium chloride followed by 70% alcohol. Cavity preparation then is made in the tooth with sterilized instruments. With a large sharp spoon excavator, decayed dentin and undermined enamel are removed. In most instances, an anesthetic is used before excavation is begun. The last scoop of carious dentin is placed in thioglycollate broth and cultured to determine the type of microorganisms present. The toilet of the cavity is completed and the cavity examined for exposure or for serious exudate.

If the pulp has become exposed, time is allowed for a clot to form, after which one 50 mg tablet of tetracycline, three drops of camphorated parachlorophenol and 5 mg of calcium hydroxide are mixed to the consistency of soft cement; a small amount is placed in the depth of the cavity or directly over the exposure. After the mixture has become rigid, a zinc oxide-eugenol liner with zinc acetate crystals as accelerator is placed over the capping agent to prevent its displacement. If the depth is sufficient, zinc oxyphosphate cement is placed over the liner. A suitable filling material is placed and the tooth is contoured out of occlusion. The rubber dam is removed and the patient is dismissed.

After one week, a vitality test is made and results compared with the original reading. Roentgenograms are made and compared with the originals.

Tubes of thioglycollate broth inoculated with infected dentin are placed in an incubator for 24 hours and then examined for growth. Usual laboratory procedures are followed and plate tests are run to determine the inhibitory action of the tetracycline paste.

In most teeth treated with this technique, the clinical symptoms vanished and did not reappear. The loss of pain indicated the inflammatory process had been alleviated.

The antibiotic paste proved more effective than other agents used for pulp capping or cavity restorations in inhibiting growth of microorganisms found in the cavity. Some patients were treated without the benefit of anesthesia. On excavation of the cavity, characteristic pain was felt. On application of the antibiotic paste, pain was slightly more intense for a few seconds, after which it subsided gradually until at the end of the operation there was no pain.

With the described technique, 97% of teeth treated were restored to normal function. (D. E. Shay, L. D. Sarubin, H. S. Spurrier, D. J. Sanders, Pulp Conservation with an Antibiotic Agent: *J Den Children*, 27: 5 - 12, March 1960)

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Relation of Oxidation-Reduction Rates to Dental Caries Activity

Since previous manometric studies at the Dental Research Facility, U. S. Naval Training Center, Great Lakes, Ill., showed that saliva from caries-rampant subjects had significantly higher substrate oxidation rate than saliva from caries-immune individuals, the present study was undertaken to determine whether there was also a significant difference in their total oxidation-reduction patterns. Thousands of naval recruits were screened; 76 were selected to serve as an experimental group; 32 of this group had extremely rampant decay, 44 had complete caries immunity. The subjects were chosen to represent the extremes of dental caries activity.

Individual salivary samples were combined with a buffered substrate solution and their oxidation-reduction potentials followed potentiometrically. The caries-rampant group exhibited a precipitous fall in potential, dropping almost 400 mv in the first 20 minutes. During the same period, the caries-immune group dropped only 100 mv. These differences were statistically significant and indicated that the salivary oxidation-reduction rate would be a useful test for distinguishing the presence or absence of dental caries activity.

In search of a more practical means of determining these rates, tests were run with various oxidation-reduction indicator dyes. The reduction of resazurin to its first reduction product, resorufin, was the only one with which it was found possible to duplicate the potentiometric findings. Resazurin

did not alter the normal oxidation-reduction patterns of the saliva, was irreversibly reduced at a suitable E_h range, and presented a very distinctive color change in its reduced form. It was concluded that the resazurin reduction time of saliva shows much promise as a simple and practical test for dental caries activity. (CDR George H. Green DC USN, Salivary Oxidation-Reduction Rates and Their Relation to Dental Caries Activity: J Dent Res, 39: 699-700, July - August 1960)

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Evaluation of Panoramic X-Ray Procedure

Modern roentgenographic procedures are cumbersome because of the large number of small films handled during exposure and development. To accelerate x-ray procedures, there have been attempts to produce x-ray pictures of an entire dental arch on one film and with a single exposure. Recently, members of the National Bureau of Standards and affiliated military service personnel developed an automatic extraoral apparatus which utilizes principles of circular panoramic photographs to produce an image of the entire oral region on a single film by means of a rotating cassette and x-ray head. For professional evaluation, the Panorex, an x-ray machine using these principles was made available to the Armed Services.

The Panorex has been found to produce with ease and rapidity a moderately acceptable full-mouth x-ray picture. The resultant film showed grain and poor contrast which caused difficulty in diagnosis of incipient interproximal caries and prevented outlining of lamina dura. However, the definition of gross lesions, restorations, and bone pathology was satisfactory enough by the Panorex method to demonstrate the general oral health of the individual. At this stage in the investigation (753 patients studied), it is felt that the Panorex film alone cannot replace the oral examination by a Dental officer. However, it showed considerable merit for the supplementation of this examination for positive identification in forensic procedures, and for permanently recording the general oral condition of the recruit on initial entry into military service. (CAPT L. M. Kraske, CDR M. S. Mazzarella DC USN, J Dent Res, July - August 1960)

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Newly Standardized Dental Items

To inform all dental activities of the availability of newly standardized dental items, the following information is provided.

To fulfill a requirement for an articulating paper that is thicker and gives a more distinct mark than the present standard item, FSN 6520-542-3150, these items have been standardized.

<u>Stock Number</u>	<u>Item Identification</u>	<u>Unit of Issue</u>	<u>Approximate Unit Price</u>
6520-687-8406	Paper, Articulating, Dental, Blue, 4 by 3/4 inches, 144s: 0.004 inch thick	Pkg	\$0.20
6520-687-8407	Paper, Articulating, Dental, Blue, 4 by 3/4 inches 72s: 0.014 inch thick	Pkg	\$0.16

(To provide an additional size and shape of dental excavating carbide bur for use in dental operating procedures, the following item has been standardized.)

6520-656-1348	Bur, Dental Excavating, Angle Handpieces Tungsten Carbide, No. 700: Crosscut Fissure, Tapered	Each	\$0.45
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Dental Department Manuals

Initial distribution of the revised Dental Department Administration, NavPers 10790-A, and the new Fiscal and Property Management in Dental Facilities, NavPers 10840, has been made to all ships and stations having Dental Corps personnel. These manuals are intended for use in the dental departments' reference libraries. Due to limited printing, additional or personal copies are not available from the Government Printing Office or any other source.

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Personnel and Professional Notes

CAPT English Retires. CAPT James A. English DC USN was transferred to the Retired List of the Navy on 1 October 1960 after 24 years of active service. He was born in Harrison Valley, Pa., and graduated with first honors from the School of Dentistry, University of Pennsylvania in June 1936. In September 1936, he accepted a commission as LTJG in the U. S. Naval Dental Corps and reported to the U. S. Naval Training Center, Newport, R. I., for duty.

Among his many assignments, CAPT English served as the Dental Requirements and Materiel Officer at Medical Supply Depots at Brooklyn, N. Y.,

and Oakland, Calif., and at the Medical Branch, Navy Supply Center, Pearl Harbor. CAPT English was awarded a commendation from the Surgeon General of the Navy for outstanding performance of duty while attached to the Medical Supply Depots. He served as Science Liaison Officer, Office of Naval Research, London, England. While on duty in London he presented many papers and lectures and was admitted as a member to the Royal Society of Medicine, London.

In addition to his degree in dentistry, CAPT English has received the degrees of M.S. in Pathology and Ph.D. in Bio-Chemistry. Among the organizations and societies of which he is a member are the American College of Dentists, American Association for the Advancement of Science, Association of Military Surgeons, American Academy of Oral Pathology, American Dental Association, and Omicron Kappa Upsilon.

Prior to his retirement, CAPT English was Head of the Medicine and Dentistry Branch, Office of Naval Research, with additional duty as Head of the Dental Research Branch, Dental Division, Bureau of Medicine and Surgery.

CAPT English is now residing in Buffalo, N.Y., where he is Dean of the School of Dentistry, University of Buffalo.

CAPT Lyon to Present Clinic. CAPT N. E. Lyon DC USN, U.S. Marine Corps Air Station, El Toro, Calif., will appear as a clinician at the American Academy of Gold Foil Operators' Program, 13 - 14 October 1960, at the School of Dentistry, College of Medical Evangelists, Loma Linda, Calif., and at the School of Dentistry, University of Southern California, Los Angeles, Calif.

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RESERVE



SECTION

Comments We Like to Read

The following letter from a member of the Navy's Ensign Medical Program was written to Doctor F. B. Engley, Chairman, Department of Microbiology, University of Missouri. The writer, ENS Larry E. Millikan 1915 USNR, a third-year medical student at the University, participated in the Clinical Clerkship Program. ENS Millikan's comments concerning his experiences are considered worthy of reprint and are published here, in part, with the permission of the writer.

2 August 1960

"Dear Doctor Engley:

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You had asked me to let you know about the Navy program. I decided to take it but decided to wait until I had been in a while before I wrote you about it.

I have really enjoyed my tour of duty thus far. I have been on Ob-Gyn for a week, Peds for a week, Medicine for two weeks (one week in the cardio-renal ward and one week on the GI ward, the ulcer clinic so to speak) and now I'm on dependents' general surgery.

In my week on the cardio-renal ward, which also handles the collagen diseases and the arthritides, I was exposed to their problems. They have many cases which tend to mimic rheumatic fever insomuch as cardiac symptoms. The perplexing problem is that none of these patients carry an antistreptolysin in their serum. They had at one time found a virus to be the source of trouble in these cases of pericarditis and myocarditis. So now they are going ahead and having NAMRU, which is the research unit, collect the acute and convalescent serums and the pericardial fluid in the future on such patients and see if they can do further work on isolation via egg passage and HeLa cell passage.

The research unit at Great Lakes has done much, in fact they specialize in work on respiratory infections. They have done (much) work on the strep throats and other manifestations of strep infection. . . .

I have been quite impressed with military medicine but also realize that we have definitely seen the best possible side of the military but aside from running a dispensary on a 2 x 2 mile island in the Pacific or going around the world twice underwater in a submarine, I think I may enjoy my service stay. I was especially impressed with the Department of Medicine as they keep up as well on the journals as do the men on the staff at school.

All in all, I have found that service medicine is much better than I had surmised from what I have heard from various people.

I also feel that I have learned a great amount thus far and the next two weeks on surgery should be equally rewarding."

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Retirement Regulations Outlined for Reservists

Following is a roundup of current policies and procedures based on the latest laws and regulations. It should clear up most questions about retirement.

Although other legislation has touched upon retirement procedures, the principal authority for nondisability retirement is still Title 10, U. S. Code, sections 6017 and 1331—formerly Title III, Public Law 810, 80th Congress, as amended. Under this law, a Naval Reservist may retire with pay when he reaches age 60—provided he has completed a minimum of 20 years of "satisfactory Federal service" and can meet certain other requirements.

Determining Eligibility. If 20 years of "satisfactory Federal service" has been completed (as defined below) as a commissioned officer, warrant officer, nurse, flight officer, aviation cadet, or enlisted person in any branch of the Armed Forces or their Reserve components, an individual is eligible upon application to receive retirement pay upon or after reaching age 60 subject to the following requirements:

1. The last 8 years of qualifying service must have been served as a member of a Reserve component. However, these 8 years do not have to be continuous.

2. He must not be eligible for—or receiving—any other retirement pay for military service.

3. If he was a member of a Reserve component before 16 August 1945 he must have served on active duty during a portion of either of the following periods: 6 Apr 1917 to 11 Nov 1918, 9 Sep 1940 to 31 Dec 1946, or 27 June 1950 to 27 July 1953.

Any Reservist who meets the age and service requirements is eligible. Any former member who met the service requirements before separation from the service under honorable conditions is eligible to apply for retirement pay upon reaching age 60. Application should be submitted approximately 6 months before becoming eligible to retire.

Creditable Service. Service in any component of the Armed Forces (including aviation cadet service performed after 15 April 1935) is creditable except the following:

1. Inactive and/or nonfederally recognized status of the National Guard and Air National Guard.

2. Inactive Reserve Section of the Officers Reserve Corps.

3. Inactive Officers Section of the Air Force Reserve.

4. Honorary Retired List after 1 July 1949 or Retired Reserve, unless this service was on active duty.

5. Service in the Public Health Service or temporary Coast Guard.

6. Naval Militia service is creditable only between 16 February 1914 and 1 July 1918. National Guard service is creditable after 21 January 1903.

7. Service as a midshipman or cadet under appointment made on or before 4 March 1913 is creditable for retired pay purposes, but is not creditable in establishing eligibility for retirement.

8. Time on the Inactive Status List (ISL) does not count for retirement purposes, but is creditable in determining rate of basic pay.

All service performed before 30 June 1949—with the exceptions noted above—is creditable for Reserve retirement with pay. On and after 1 July 1949, Reservists must earn 50 retirement points each anniversary year in order to have that year count as a year of "satisfactory Federal service" for retirement purposes.

Earning Retirement Points. Retirement points are credited to Reservists as follows:

1. One point for each day of active duty or active duty for training (ACDUTRA), including travel time.

2. One point for each authorized drill attended in either pay or nonpay status.

3. One point for each period of equivalent instruction or appropriate duty performed as authorized by the cognizant commandant or the Chief of Naval Personnel.

4. Points are credited upon satisfactory completion of authorized correspondence courses. The point credit varies in accordance with the course completed. For officers, these retirement points for most courses are credited as follows: Credit for courses evaluated at 12 retirement points or less will be granted upon satisfactory completion of the entire course; credit will apply as of the date the last assignment was mailed by the officer. Credit for courses evaluated at more than 12 retirement points will be granted in most cases on satisfactory completion of (1) each 12-point unit of the course, and (2) the final unit which may be less than 12 points. Credit applies as of the date the last assignment of each unit is mailed. For enlisted Reservists, points for each course will be prorated by assignment, and the points for each assignment will be credited as of the date the assignment is mailed—but only after satisfactory completion of the entire course.

5. "Gratuitous Points" - 15 points are credited for each year of membership in a Reserve component except when on the Inactive Status List or in the Retired Reserve. "Gratuitous points" are no longer prorated according to the amount of active duty or ACDUTRA performed. However, 15 "gratuitous points" are not creditable if a Reservist is on full-time active duty for an entire year.

6. A maximum of 60 retirement points each year may be credited by means of all but the first of the items listed above. Points for active duty and ACDUTRA may be added to this 60-point maximum.

Satisfactory Federal Service. Effective 1 July 1949, a year of "satisfactory Federal service" is earned by accumulating a minimum of 50 retirement

points during an anniversary year. Before this date, a satisfactory year—or portion thereof—was awarded for each year or portion of a year served in the Armed Forces, including the Reserve components, and whether on active or inactive duty. Thus, if an individual enlisted in the Naval Reserve on 3 April 1942, and maintained his membership continuously, he would be credited with 7 years, 2 months, and 27 days of satisfactory Federal service as of 30 June 1949. Thereafter, he would have to earn 50 retirement points each anniversary year until he completes 20 years of satisfactory Federal service.

Anniversary Year. The "anniversary year" for Naval Reservists who were members on 30 June 1949 runs from 1 July to 30 June; for those members entering after 30 June 1949—or whose Reserve service was broken after that date—the anniversary year extends from the date of entry or reentry.

An entry is considered to be the first appointment or enlistment of a member in the Naval Reserve. In the situation of a Regular Navy officer resigning from the Navy and accepting an appointment in the Naval Reserve, his anniversary date will be the date on which he accepts his USNR appointment. A reentry takes place when the member has resigned or been discharged from the Naval Reserve and not immediately reappointed or reenlisted, or when his Reserve service has been broken by service in a Regular component. (The Naval Reservist, November 1959)

(To be continued in the next issue)

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PREVENTIVE MEDICINE

Toxicity of Dieldrin to Man

Dieldrin is a toxic substance which is freely absorbed by the skin. Dry dieldrin is absorbed about as easily as dieldrin put on the skin in solution. The insecticide is less than twice as poisonous by mouth as by skin application—an insignificant safety factor. Dieldrin differs greatly from DDT in this respect. The oral toxicity of dieldrin is only 3 to 5 times greater than that of DDT. However, DDT is not readily absorbed by the skin even when in solution, and dry DDT is so little absorbed by the skin that toxicity is not evident.

Dermal toxicity of dieldrin has not been fully appreciated by some who have used the compound in antimalaria programs. A relevant point which has

been even more generally missed is that all of the unclothed skin of a spray-man (and to a smaller extent his protected skin also) is subject to constant contamination during the process of spraying. This "imperceptible" contamination is added to any visible soiling from spillage or other direct contact with dieldrin powder or suspension. Chemical measurements of "imperceptible" contamination during indoor spraying have emphasized the magnitude of the problem and also have shown the relative unimportance of respiratory exposure. These measurements are of special importance because, commonly, it has been assumed without any basis that the major source of dieldrin poisoning is respiratory exposure. This is an understandable mistake because the great importance of gases, metal fumes, and silica dust in industrial medicine has led to great emphasis on respiratory exposure. It is also true that dieldrin is poisonous if inhaled. The crux of the matter is that only small particles can be inhaled, and nearly all the dieldrin in water-wettable powder is impregnated on particles too large to be inhaled. The spraying process does not grind the powder finer. On the contrary, wetting the powder makes it more dense and spray droplets may be appreciably larger than the powder particles which they contain. It follows that measurement of the concentration of dieldrin in the air during spraying may be entirely misleading unless the particle size and fact of dermal toxicity are taken into account.

If one assumes that man is as susceptible to dieldrin poisoning as experimental animals, then the "imperceptible" mist of dieldrin suspension which falls on the unprotected face and lower arms of spray-men is sufficient to account for the incidence of poisoning which has been observed. This is not surprising in view of the fact that during the working day the spray mist which is imperceptible as it falls often accumulates on the exposed skin to form an easily visible residue.

Another technical point is that any given dosage of dieldrin is absorbed more readily by a large area of skin than by a small area. This means that any increase in the area of skin exposed not only increases the dosage that will be received but facilitates absorption.

Many cases which have been recognized as dieldrin poisoning have involved serious illness. The proportion of recognized cases showing one or more epileptic fits has varied from 47 to 100% in different countries. The occurrence of fits in a very high percentage of cases almost certainly means that some less severe cases were missed. In fact, there is no assurance that the complete spectrum of dieldrin poisoning is known at this time. Among the cases of dieldrin poisoning, at least 6 men had one or more fits 15 to 120 days following the last exposure to dieldrin. It is probably too early to assume that some of these men will not have another fit. Furthermore, because it has not been possible to follow all cases of recognized poisoning even for a few months after dieldrin exposure had ceased, it is probable that the recurrence of symptoms was missed in some cases. Recurrent convulsions have been observed in experimental animals and occasionally persist until the animal

dies at an old age. In addition to sudden falls, unconsciousness, and convulsions, another disturbing sign in some cases of dieldrin poisoning in man and animals is mental disorder. In man, the trouble has taken forms ranging from loss of memory, insomnia, and nightmares to mania. It is reported that two men have died in convulsions following exposure to dieldrin; the cases have not yet been properly studied. Therefore, it is not possible to state whether either showed a syndrome clinically similar to that of poisoning observed in animals which is characterized by complete loss of appetite and consequent severe weight loss and which is uniformly fatal in the absence of medication.

It is true that, after having a fit, some spray-men continued their occupational exposure to dieldrin without disastrous effects. However, the recurrence of symptoms in men and animals after cessation of exposure raises the possibility that dieldrin produces a morphologic and/or biochemical lesion which persists for some time and may give rise to recurrent illness. It may be assumed that during exposure dieldrin circulates in the blood and becomes stored in the fat. Unfortunately, practically nothing is known of the dynamics of dieldrin storage. It is, therefore, impossible to state the relationship between storage and the observed recurrence of characteristic illness following long intervals without re-exposure.

There is clear evidence of a direct relationship between dosage and occurrence of poisoning. This is manifest in at least four ways:

1. The greater the concentration of dieldrin suspension used for spraying, the greater is the chance that poisoning will occur following a given period of exposure.

2. Under otherwise similar conditions, the greater the area of bare skin exposed during spraying the more likely is poisoning to occur.

3. The longer the exposure (at least up to 2 years) under conditions which lead to some poisoning, the greater will be the total incidence of poisoning. It seems certain that intervals between cycles of exposure allow some excretion of stored dieldrin, but the rate of such excretion is unknown. Rest periods may also permit some degree of recovery from other possible effects of dieldrin. The fact remains that the practical importance of rest periods in preventing dieldrin poisoning is not known.

4. Immediate washing of the contaminated skin is partially protective; delayed bathing offers distinctly less protection. Although one may assume on logical grounds that absorption of dieldrin continues as long as the compound is in contact with the skin, there is no objective evidence that washing which is delayed for several hours or more after exposure has any protective effect whatsoever.

A general principle of toxicology is that even the most poisonous compound may be used if adequate safeguards are provided. It does not follow that adequate safeguards can be provided under all conditions.

It is clear from the record of use that dieldrin is a dangerous compound. It should not be used for indoor spraying unless resistance of the vector to

safer insecticides—or some other good reason—makes dieldrin really necessary for disease control. If those responsible for vector control programs consider it necessary to use dieldrin, they have a responsibility to recognize the calculated risk.

Suggested protective measures are:

(1) Each worker should be told when he is hired that he is to work with a dangerous compound which has produced serious sickness in men like himself. Dieldrin poisoning and the protective measures which will be required should be described.

(2) Rigid supervision should be maintained to insure the practice of:

(a) Washing the hands at frequent intervals even though no contamination is visible.

(b) Washing the hands and face with soap and water before meals and before smoking.

(c) Washing with soap and water after each recognized contamination of the skin.

(d) Bathing the entire body with soap and water at the earliest practicable moment after work is finished for the day. It is sometimes stated that there is inadequate water for washing; to the toxicologist, there is always enough water for washing if there is enough for spraying. The cost of hauling the water simply must be counted in the cost of spraying.

(3) Free soap should be available for the washing recommended under items 2 and 4. It was found on one program that a ration of 250 gm of soap per man per week was adequate. In another program, new soap was issued to each man when he exhausted his previous supply.

(4) Work clothing should be washed daily with soap and water. If this daily laundry is not done by an outside contractor, then it becomes a responsibility of each spray-man and must, of course, be done during working hours and under the supervision of a foreman like any other duty for which the spray-man is employed.

(5) Arrangements should be made for each spray-man (including pumps and mixers) to have at least two sets of work clothes with a high neckline, long sleeves, and long trousers. The work clothes are not to be worn after working hours. The clothing must not be worn with the sleeves or trousers rolled or with the collar open.

(6) Arrangements should be made to insure that spray-men wear shoes and socks.

(7) Each worker should have a broad-brimmed, water-repellant hat. Hats of local manufacture that satisfy these requirements are acceptable and frequently much cheaper than imported hats.

(8) A veil of plastic netting should be attached to the hat in order to protect the face, neck, and shoulders of spray-men in projects where the climate or some other factor prevents the wearing of a plastic face shield. (Visors as on caps worn by tennis players do not give adequate protection.)

(9) Rubber gloves are desirable only if used properly. Gloves which are contaminated on the inside are a source of added danger rather than protection. The hands should be washed before gloves are put on and gloves should be washed before they are removed.

(10) A short (arm-length) cape of plastic sheeting or cotton cloth offers some added protection to the clothed areas beneath it. A cape cannot be considered a substitute for any of the equipment listed under items (1) and (9).

It would be unrealistic to assume that adequate protection can be achieved by substituting bathing for clothing. As already mentioned, the bare head and lower arms provide enough surface for receiving a poisonous dosage of dieldrin in the course of several months of spraying. A larger area of bare skin increases the hazard. If dieldrin reaches the skin, some of it will be absorbed before it can be washed off. Therefore, washing and bathing must be an important second line of defense to remove as completely as possible any insecticide which has penetrated the clothing or other protective equipment.

Emphasis on dermal exposure and absorption is not to suggest that dieldrin is not poisonous by other routes. Respiratory toxicity is unlikely to occur only because of the unlikelihood of exposure to a sufficient density of dieldrin-bearing particles 1 to 5 microns in diameter.

The possibility of poisoning from eating dieldrin is much greater than the possibility of poisoning from inhaling it. It takes only about half as much dieldrin to produce sickness if it is eaten as it does if it is put on the skin. On the other hand, the contamination of the exposed skin of spray-men while they work is inevitable and continuous. The need for protection is not obvious to the ordinary laborer, and even the most practical protective equipment produces some discomfort. By contrast, the need to avoid eating dieldrin is obvious and the means for doing this are simple and involve no real discomfort, although it may take some self-restraint to delay eating, drinking, or smoking until the hands have been washed and until a suitable, uncontaminated place has been found.

It takes a little planning to transport lunches, drinking water, and tobacco without contaminating them. The possibility cannot be excluded that some cases of occupational poisoning have involved ingestion of dieldrin. However, in studying different programs, it has not been possible to associate poisoning definitely with eating, drinking, or smoking habits. Finally, as already mentioned, measured contamination of the skin is adequate to explain the observed clinical result.

In addition to protective measures which apply to the individual worker, other factors need to be taken into account:

(1) Sprayers must be kept in repair so that they do not leak.

(2) Measuring cups, mixing buckets, funnels, and other devices must be provided with handles which will permit the workers to use them without touching dieldrin powder or suspension.

(3) Sprayers should be used at the lowest pressure consistent with vector control. It has been shown that the contamination of the worker is much greater at a pressure of 50 psi (3.5 Kg per cm²) than at 20 psi (1.4 Kg per cm²).

(4) At least one professional man should be appointed safety officer with full power to enforce regulations and no other responsibilities. The appointment of such an officer will greatly support the authority of foremen who accompany spray-men during the entire working day. It is understood that discipline cannot be adequate unless each spray-man is subject to summary discharge if he violates safety rules and unless each foreman is also subject to discharge for failure to carry out his duty in regard to safety.

(5) Spray-men and mixers should not be permitted to work more than 8 hours per day or 40 hours per week.

(6) It must be frankly admitted that, in terms of wall area covered and excluding the cost of insecticide, it is more expensive to apply dieldrin safely than to apply an insecticide like DDT safely.

(W.J. Hayes Jr, The Toxicity of Dieldrin to Man, Report on a Survey, CDC Technology Branch, No. 16, Summary of Investigations, 1 - 21, April through December 1959)

NOTE: In the Navy, dieldrin emulsifiable concentrate is a controlled item which is issued only upon the approval of appropriate district public works or medical entomologists in order to assure that the material is issued only to personnel who are qualified to use it.

* * * * *

"Cloud Baby" - Example of Bacterial Viral Interaction

Detailed studies on spread of staphylococci in a number of different nurseries, carried out by the use of epidemiologic techniques in conjunction with air-sampling methods, have shown that a newborn infant infected with staphylococci may fall into one of two distinct groups. The majority of babies possess a low index of infectivity or contagiousness while a small minority are highly infectious to others. Because infants of the latter group are literally surrounded by clouds of bacteria, they have been called "cloud babies."

Evidence clearly indicates that these "cloud babies" are an important factor in explosive outbreaks of staphylococcal infection and disease, both during their stay in a nursery and after discharge within the family unit.

Factors that determine whether any given infant becomes a "cloud baby" or not have been investigated by use of air-samplers to measure the degree of "cloudiness." The clinically well "cloud baby" contaminates the

atmosphere chiefly from his respiratory tract with skin, cord, or clothing representing only a minor source of microbes. The appearance of lesions of staphylococcal disease, such as impetigo, generally converts a noninfectious infant to a disseminator, and these sites of disease then contribute to dissemination of microbes.

"Cloud babies" do not present any overt sign of disease. Investigation of these clinically well, but infectious, infants showed that a factor is responsible for the phenomenon of "cloudiness" which operates independently of the staphylococcus, is in itself infectious, and has a distinct epidemiology of its own. This factor appears to consist of a number of respiratory viruses occasionally encountered in hospitalized newborn infants. (H. F. Eichenwald, et al, Amer J Dis Child, 100: 161-173, August 1960)

* * * * *

Isolation of Phlebotomus Fever Virus

The hairy midge or sandfly, *Phlebotomus papatasi*, has long been regarded as the probable vector of phlebotomus (sandfly) fever. Evidence incriminating the sandfly includes experimental human to human transmission, similarities in the geographic and seasonal distribution of *Phlebotomus* flies and the disease, and a marked reduction in the incidence of the disease following control measures directed against *P. papatasi*. Although the virus of phlebotomus fever has been isolated repeatedly from man and has been extensively studied in the laboratory for the past decade, its recovery from wild-caught, naturally-infected sandflies has not been reported. Data on isolation of the virus from wild-caught *P. papatasi*, collected from human dwellings in suburban Cairo, Egypt, are presented in this article.

A total of 24,179 female *Phlebotomus* flies collected in suburban Cairo were examined for phlebotomus fever virus. Virus was recovered from 4 of 59 sandfly pools tested; one pool of *Phlebotomus papatasi* and 3 pools of unidentified *Phlebotomus*, presumably consisting solely of *P. papatasi*, yielded virus. All of the four isolates were identified by complement-fixation tests as the Sicilian type of virus. Wild-caught engorged *P. papatasi* flies were shown to contain substances which neutralize the Sicilian type of phlebotomus fever virus. Failure to demonstrate similar activity in laboratory-reared sandflies suggests that the active principle is antibody contained in ingested human blood. (J. R. Schmidt, et al, Isolation of Phlebotomus Fever Virus from *Phlebotomus Papatasi*: Amer J Trop Med, 9: 450-454, July 1960)

* * * * *

Inapparent Measles After Gamma Globulin Administration

Nineteen of 38 susceptible children who were exposed to measles and given gamma globulin developed measles antibodies without overt signs of disease. Five of the 19 children failed to contract measles when exposed again 7 months later. Titers of antibodies acquired as a result of inapparent infection were generally lower than titers resulting from overt disease when serums were tested about 7 weeks after infection.

Epidemiologic evidence indicates that the inapparent infections were less contagious than unmodified cases. In order to avoid needless readministration of gamma globulin on subsequent exposure, it is suggested that the complement fixation test may be used to determine the immune status of children exposed to measles who were initially considered susceptible yet remain asymptomatic after receiving a dose of gamma globulin. (F. L. Black, H. Yannet, JAMA, 173: 1183-1188, 16 July 1960)

* * * * *

Course and Prognosis of Sarcoidosis

Observations are presented on the course of sarcoidosis in 211 patients, 184 Negroes and 27 Caucasians, observed in Philadelphia for as long as 20 years with a mean interval of 5.9 years.

Survival rates calculated by the life table method were 88.8% after 5 years of observation and 84.8% after 10 years of observation. Comparison with the life expectancy of normal persons similar in age, sex, and race indicates a considerable diminution of survival as the result of sarcoidosis.

Complete recovery was observed in 34.6% and improvement in 31.8%, while in 16.1% the condition became worse. The mortality rate was 9.5% with 16 deaths due to sarcoidosis, 3 to tuberculosis, and one to incidental disease. In 4 other patients tuberculosis developed, one of whom was among the 93 patients treated with corticosteroids. In only 2 instances was recurrence of sarcoidosis observed.

The incidence of erythema nodosum was much less frequent than reported in English and Scandinavian studies, and clearing of mediastinal adenopathy occurred less often and less rapidly than in these two countries. With these exceptions, the course of sarcoidosis appears to be similar in both Philadelphia and Northern Europe.

Although the prognosis appears to be less favorable in Negro patients and in those patients with many systems involved, analysis indicates that cutaneous involvement is the feature most closely associated with progressive and fatal sarcoidosis. (M. Sones, H. L. Israel, Course and Prognosis of Sarcoidosis, Amer J Med, 29: 84-93, July 1960)

Streptococci and Rheumatic Fever in Miami

The authors report recovery of 842 strains of non-group A beta hemolytic streptococci from 11,014 throat cultures taken from children and adults participating in studies in Dade County, Fla., February 1953 to May 1956, indicating that these organisms were common in South Florida.

Groups A, B, F, and non-groupable organisms were isolated from the throats of white and Negro subjects with approximately equal frequency, while group G organisms were recovered somewhat more frequently from throat cultures from Negro than from white children. Throat cultures from Negro children yielded group C beta hemolytic streptococci four to five times as frequently as did cultures from white children.

The necessity for grouping beta hemolytic streptococcal isolates is emphasized and discussed in order to differentiate non-group A from group A organisms. Non-group A strains are common, they may be related to respiratory illness and may confuse the physician in his evaluation of a streptococcal isolate as one of the minor diagnostic criteria of rheumatic fever. (M. M. Streitfeld, M. S. Saslaw, Group A Beta Hemolytic Streptococci and Rheumatic Fever in Miami, Florida: Dis Chest, XXXVIII, 73-78, July 1960)

* * * * *

Penicillin Resistant Gonococci

There are numerous reports of failures to cure gonorrhea with the usual recommended, or even larger, doses of penicillin. Several authors are of the opinion that the gonococcus has actually developed resistance to penicillin; some doubt the bacteriologic diagnosis; other investigators are of the opinion that a penicillinase-producing staphylococcus or other type of organism may be a companion of the gonococcus in a number of cases of urethritis.

Attention is invited to three recent articles which continue the argument. In the U. S. Armed Forces Medical Journal, Vol. 11, October 1960, Mead, Moon, and Bean report on 11 cases of gonorrheal urethritis clinically resistant to treatment with a minimum of four daily injections of 600,000 units of procaine penicillin G. The bacteriologic diagnosis in these cases was made on the basis of gram stained smears and cultures on chocolate agar incubated in an atmosphere of 10% carbon dioxide.

Bacteriologic diagnostic deficiencies are stressed in an article by Gangarosa and Cary in the JAMA, Vol. 173, August 20, 1960. These authors maintain that penicillin in adequate dosage remains the drug of choice for the treatment of acute gonococcal urethritis, and offer explanations for apparent treatment failures. Gangarosa and Cary further state: "The development of strains of *Neisseria gonorrhoeae* resistant to penicillin has not been proved."

A complex bacteriologic study employing organisms isolated at Boston City Hospital from August 1958 to February 1959, was reported by Hirsch and Finland in the American Journal of the Medical Sciences of January 1960. These investigators determined in vitro sensitivity of pure cultures of *Neisseria gonorrhoeae* to 20 antibiotics and sulfadiazine. The results of in vitro sensitivity to some of the same antibiotics of *N. gonorrhoeae* strains isolated in earlier years were available for comparison. The data presented offer an indication of a possible decrease in susceptibility of gonococci to penicillin from cases of urethritis that may be correlated with penicillin treatment failures. Practically all cultures are now susceptible to sulfadiazine, but the authors do not recommend a return to sulfonamides for treatment of gonorrhea because of the likelihood of rapidly establishing sulfonamide resistant strains. This therapy is less reliable and has never been as successful as modern antibiotic treatment when properly used.

In view of the conflicting reports, a "wait and see" attitude must be assumed and search continued for an explanation of penicillin treatment failures in cases of gonococcal urethritis. (Venereal Disease Control Section, PrevMedDiv, BuMed)

* * * * *

Prophylaxis of Infectious Hepatitis

The administration of gamma globulin to persons exposed to infectious hepatitis is effective in preventing or modifying the disease provided the administered dosage of gamma globulin is adequate. The Technical Information Manual for Medical officers, section on Immunization, NavMed P-5052-15, recommends a dosage of 0.05 ml per lb of body weight. The Control of Communicable Diseases in Man, NavMed P-5038, published by The American Public Health Association, 9th Edition, on the other hand, recommends a dosage of 0.01 ml. Studies sponsored by the Armed Forces Epidemiological Board through its Committee on Hepatitis indicate that the 0.01 ml per lb dosage is inadequate, especially in adults. It is recommended that a dosage of gamma globulin of 0.05 ml per lb of body weight be used for the control of infectious hepatitis. Its use is recommended for persons exposed to known cases, and for closed populations, such as aboard ships, when a case of infectious hepatitis occurs. (PrevMedDiv, BuMed)

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NOTICE: In the abstract, Recent Advances in the Chemotherapy of Infection, presented in the Preventive Medicine Section of the News Letter for 5 August and 23 September 1960, reference was made to Sulfamethoxypyrimidine, (Madribon). It has been brought to our attention that the proprietary product mentioned is more properly known, generically, as sulfademethoxine. Editor

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